

Chapter 10 Lesson Plan

Power Systems

Chapter Resources		
Textbook Activity	Teacher CD	Online Learning Center
Inventory Simple Machines List devices in your home and school that use the principle of a simple machine; calculate mechanical advantage.	Lesson Plan Flash® Presentation ExamView® Chapter Test	Chapter Activities Chapter Quizzes

FOCUS

Chapter 10 covers the topics of mechanical, fluid, and electrical power systems.

Objectives

- Name and discuss six simple machines.
- Describe several devices used to transmit mechanical power.
- Compare and contrast hydraulic and pneumatic systems.
- Explain the differences between alternating and direct current.

Tying to Previous Knowledge

Bring in a car jack. Use it to lift up a heavy weight that no ordinary single student could possibly lift (perhaps the side of your desk with two students sitting upon it).

Ask the class to determine why it was relatively easy to move the item with the jack (mechanical advantage).

TEACH

1. **Demonstration.** Using a strong piece of lumber (perhaps a 2 x 2) about six feet long as a lever, pry up a heavy weight (by pushing down on the lumber). Ask the students to determine why it was possible to lift such a heavy load. See if the class can figure out the mechanical advantage by numerous experiments with lever length, etc.
2. **Experiment.** Weigh a group of books. Load the books upon a rolling base (any type will do, even a couple of dowels underneath a piece of wood). Pull the books along with a spring scale. Compare the force necessary to pull the books with the weight of the books themselves. Why are the two numbers not the same? (Introduce the idea of *friction*.)
3. **Research.** Ask the students to research and demonstrate how a typical bicycle pump operates.
4. **Research.** Ask the students to research how a water gun operates. How can the gun be made to squirt farther?

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Power Systems (continued)

ASSESS

Have students complete Chapter Test 10. Chapter tests are found in the *ExamView*® Assessment Suite on this Teacher Resource CD-ROM.

Reteach

1. Define relief (generically) for the class. Then ask what they think the function of a relief valve is in a hydraulic system.
2. How is a hypodermic needle similar to a hydraulic system? (What does the word *hypodermic* mean?)

Enrich

1. Ask students to research why electricity (invisible, tasteless, odorless, and weightless) can cause fires in the home. Can anyone commercially make, or produce, electricity that cannot cause a fire?
2. Why are so many plugs now manufactured with one prong wider than the other?

REFLECT

Ask the class to consider why drive-chain devices, such as gears, pulleys, and couplings, are necessary. Can power systems run without them?